

**REMARKS**

Claims 1, 3, 4, 5 and 10 have been amended. In particular, claim 1 has been amended to include the limitation of claim 5, namely that the enzyme content in the core unit, calculated as pure enzyme protein, is in the range of from about 20% to 100% by weight of the enzyme core unit. Claims 3, 4, 5 and 10 have been amended to address the indefiniteness rejection; in particular, these claims no longer recite a broader limitation together with a narrow limitation falling within the broader limitation. The narrower limitations recited in claims 3, 4, 5 and 10 have now been included as new dependent claims 39-52.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

**I. The Rejection of Claims 3-5, 10 and 26 under 35 U.S.C. 112**

Claims 3-5, 10 and 26 are rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite. The Examiner states that these claims improperly recite a broader limitation together with a narrow limitation falling within the broader limitation.

As amended, claims 3-5, 10 and 26, no longer recite a broader limitation together with a narrow limitation falling within the broader limitation. Accordingly, Applicant submits that the claims overcome this rejection under 35 U.S.C. 112. Applicant respectfully requests reconsideration and withdrawal of the rejection.

**II. The Rejection of Claims 1-6, 8 and 26 As Anticipated By Kamel et al.**

Claims 1-6, 8 and 26 are rejected under 35 U.S.C. 102(b), as allegedly anticipated by Kamel et al., US Pat. No. 5,230,822. The Examiner contends that Kamel et al. discloses an enzyme-containing granule comprising all of the features recited in claims 1-6, 8 and 26.

As amended, the claims recite an enzyme-containing granule comprising a core unit and a shell unit, wherein the core unit comprises the enzyme and is enclosed in a shell unit which is substantially enzyme-free, and the enzyme content in the core unit, calculated as pure enzyme protein, is in the range of from about 20% to 100% by weight of the enzyme core unit, and wherein the ratio between the diameter of the granule and the diameter of the core unit is at least 1.1.

With respect to the amount of enzyme in the core unit, Kamel et al. disclose that the amount of enzyme in the cleaning composition, if it contains enzyme, would be present in an

amount of 0.1 to 5% by weight of the composition. See Kamel et al. Col. 15, lines 42-45. Therefore, Kamel et al. does not teach an enzyme-containing granule having the properties recited in the claimed invention, as Kamel et al. clearly does not teach that the amount of pure enzyme in the core unit should be in the range from about 20% to 100%.

For the foregoing reasons, Applicant submits that the claims overcome this rejection under 35 U.S.C. 102(b). Applicant respectfully requests reconsideration and withdrawal of the rejection.

### III. The Rejection of Claims 1-6, 9 and 26 As Anticipated By Herdeman

Claims 1-6, 8 and 26 are rejected under 35 U.S.C. 102(b), as allegedly anticipated by Herdeman, U.S. Pat. No. 4,707,287.

Herdeman also does not disclose the features of the claimed invention, including that the amount of pure enzyme in the core unit should be in the range from about 20% to 100%. In particular, Herdeman discloses an enzyme composition made with an enzyme powder level from about 1% to 20% (0.5 to 10 Au/gram), more preferably from about 1% to 10% (0.5 to 5 Au/gram) by weight of the total composition. See Herdeman at Col. 2, lines 61-65. Herdeman's disclosure of the amount of enzyme powder to be used, however, does not disclose or suggest to one skilled in the art that the amount of pure enzyme in the core should be in the range from about 20% to 100%.

For the foregoing reasons, Applicant submits that the claims overcome this rejection under 35 U.S.C. 102(b). Applicant respectfully requests reconsideration and withdrawal of the rejection.

### IV. The Rejection of Claims 1-10 and 26 under 35 U.S.C. 103

Claims 1-10 and 26 are rejected under 35 U.S.C. 103, as allegedly obvious over Kamel et al. The Examiner acknowledges that Kamel et al. does not expressly teach an enzyme-containing granule wherein the granule is a co-granule comprising more than one type of enzyme (claim 7), or a multiplicity of enzyme granules wherein the enzyme units have a particle size distribution such that the ratio (D90-D10)/D50 is not more than 2.5 (claim 10). However, the Examiner contends that it would have been prima facie obvious to modify the number of enzymes in the granules to attain the advantages of a more widely useful product in that more enzymes yield more potential applications.

As previously discussed, Kamel et al. clearly does not teach the features of the present invention, including, that the enzyme content in the core unit, calculated as pure enzyme protein, is in the range of from about 20% to 100% by weight of the enzyme core unit.


Therefore, Applicant submits that the claims overcome this rejection under 35 U.S.C. 103. Applicant respectfully requests reconsideration and withdrawal of the rejection.

**V. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Examiner: Ozga, B.

For: Enzyme Granulate

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

Sir:

Below is a marked-up version of the amendments made in the accompanying amendment.

**IN THE CLAIMS:**

Claims 1, 3, 4, 5, and 10 have been amended as follows:

1. (Amended.) An enzyme-containing granule comprising a core unit and a shell unit, wherein the core unit comprises the enzyme and is enclosed in a shell unit which is substantially enzyme-free, and the enzyme content in the core unit, calculated as pure enzyme protein, is in the range of from about 20% to 100% by weight of the enzyme core unit, and wherein the ratio between the diameter of the granule and the diameter of the core unit [being] is at least 1.1.
2. (Unchanged.) An enzyme-containing granule of claim 1, wherein the ratio between the diameter of the granule and the diameter of the core unit is at least about 2.5.
3. (Amended.) An enzyme-containing granule of claim 1, wherein the size of the enzyme core unit, in terms of its diameter in its longest dimension, is no more than 1000  $\mu\text{m}$ [, preferably no more than 700  $\mu\text{m}$  or 600  $\mu\text{m}$ , preferably between 100 and 500  $\mu\text{m}$ , such as between 100 and 400  $\mu\text{m}$ , preferably between 200 and 300  $\mu\text{m}$ ].
4. (Amended.) An enzyme-containing granule of claim 1, wherein the size of the core unit, in terms of its relative mass compared to the overall mass of the granule, is up to about 30%[,

such as up to about 20%, such as up to about 15%, preferably up to about 10%, such as up to about 5%].

5. (Amended.) An enzyme-containing granule of claim 1, wherein the enzyme content in the core unit, calculated as pure enzyme protein, is [in the range of from about 20% to 100% by weight of the enzyme core unit, preferably no less than 25%, such as no less than 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%, 70%, 75%, 80%, 85%, 90%, or 95% by weight] at least 25% by weight of the enzyme core unit.

6. (Unchanged.) An enzyme-containing granule of claim 1, wherein the enzyme is homogeneously dispersed within the enzyme core unit.

7. (Unchanged.) An enzyme-containing granule of claim 1, wherein the granule is a co-granule comprising more than one type of enzyme.

8. (Unchanged.) An enzyme-containing granule of claim 1, wherein the granule comprises a structured core unit such as a multi-layered core unit or a clustered-particle core unit.

9. (Unchanged.) An enzyme-containing granule of claim 1, further comprising a film layer around the core unit to protect the core unit from components present in the shell unit.

10. (Amended.) A granulated enzymatic product comprising a multiplicity of enzyme granules of claim 1, wherein the enzyme core units have a particle size distribution such that the ratio  $(D_{90} - D_{10})/D_{50}$  is not more than about 2.5[, preferably not more than about 2.0, more preferably not more than about 1.5, most preferably not more than about 1.0].

26. (Unchanged.) A composition comprising enzyme-containing granules of claim 1.